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DeVaney

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(54) **SPRINKLER PROTECTION SYSTEM**

(76) Inventor: **Nick DeVaney**, Fox Island, WA (US)

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B05B 1/28 (2006.01)
A62C 31/28 (2006.01)

(52) **U.S. Cl.**
CPC ***A62C 31/28*** (2013.01); *Y10T 29/49826* (2015.01)

(58) **Field of Classification Search**
CPC Y10T 29/49826; A62C 31/28
USPC 239/288.5, 288.3, 428; 47/40.5; 169/37–42, 51
See application file for complete search history.

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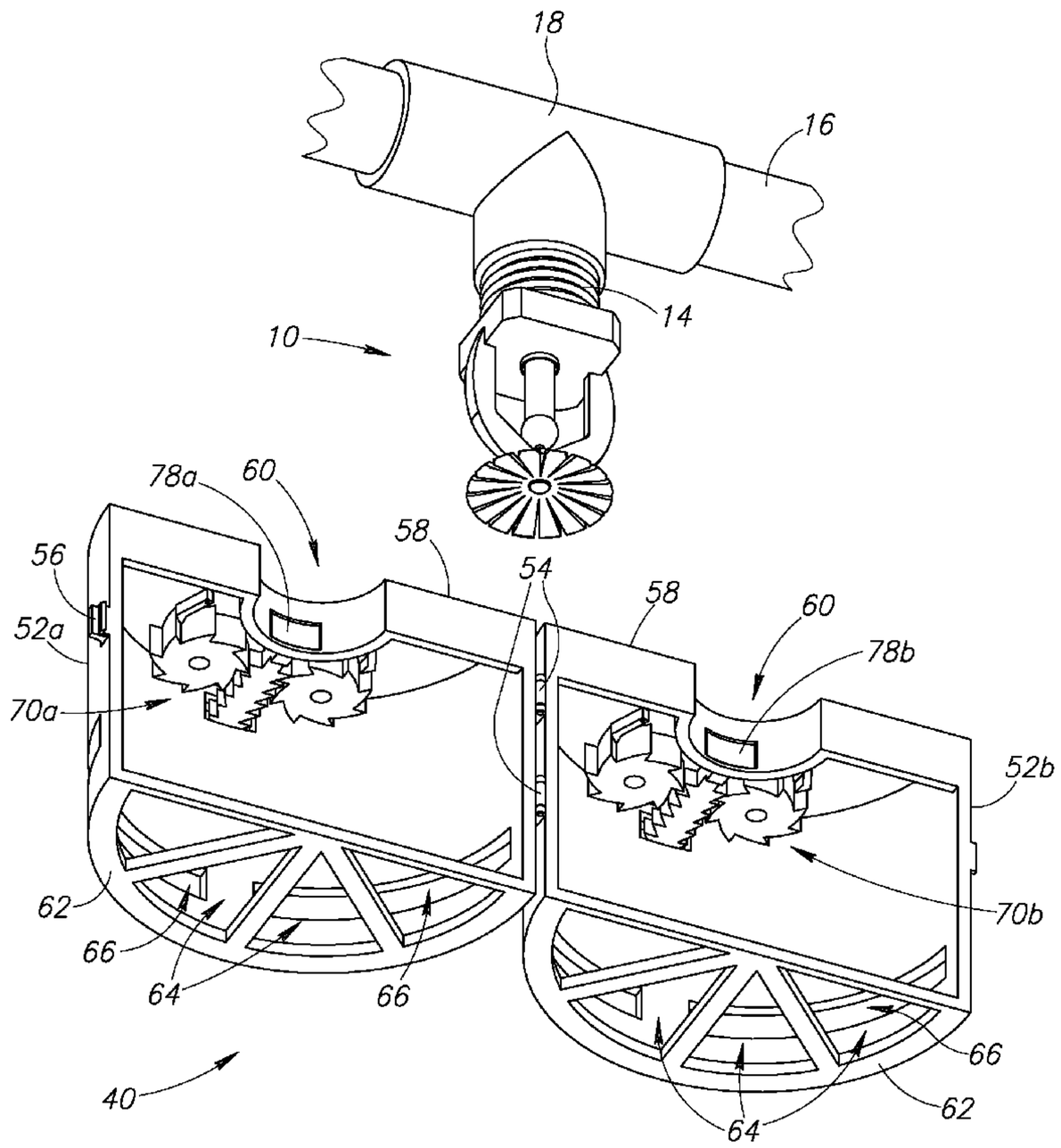
Primary Examiner — Len Tran
Assistant Examiner — Joel Zhou
(74) *Attorney, Agent, or Firm* — Lowe Graham Jones PLLC

(57) **ABSTRACT**

A sprinkler protection system for protecting an existing sprinkler installation includes housing sections that cooperate to cover a majority of a sprinkler unit, such as a ceiling-mounted sprinkler unit. The housing sections can include one or more apertures aligned with a deflector of the sprinkler to permit the deflector to direct water through the aperture and out of the housing without significantly impeding the water output of the sprinkler and offer greater protection to the sprinkler unit.

9 Claims, 4 Drawing Sheets



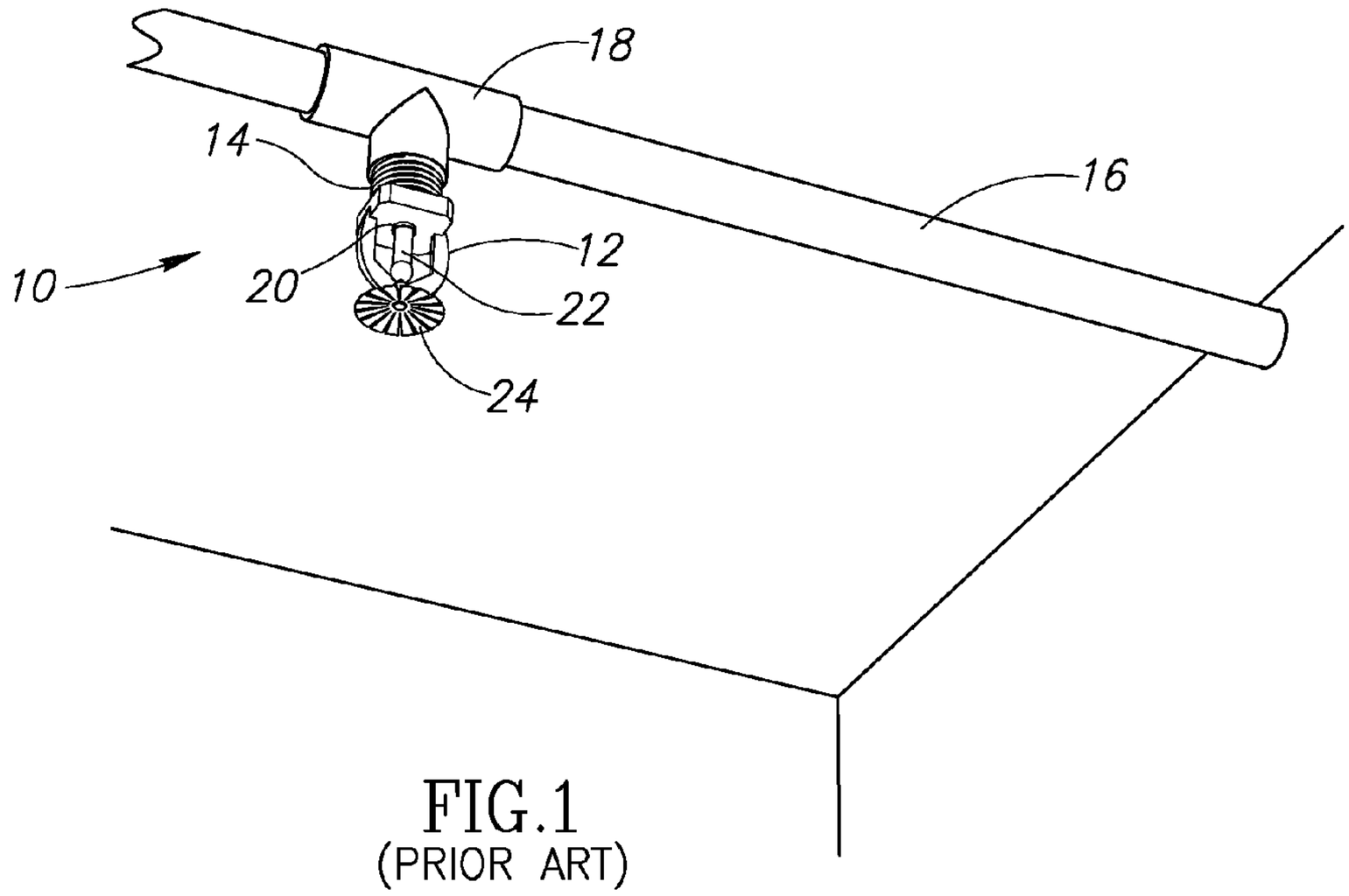


FIG.1
(PRIOR ART)

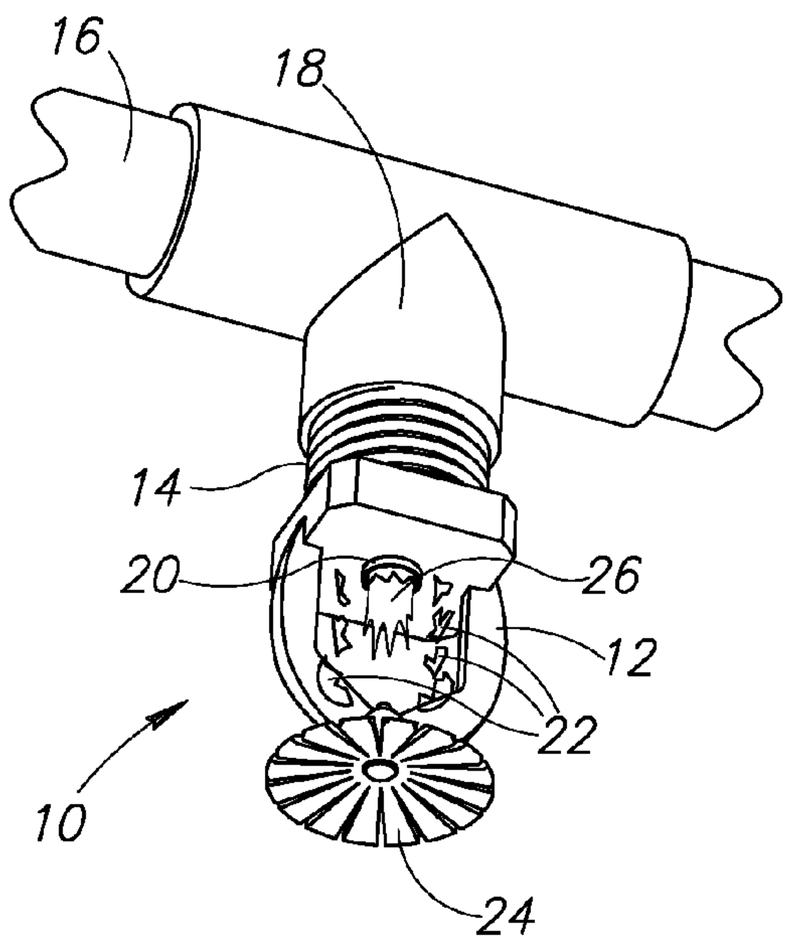


FIG.2
(PRIOR ART)

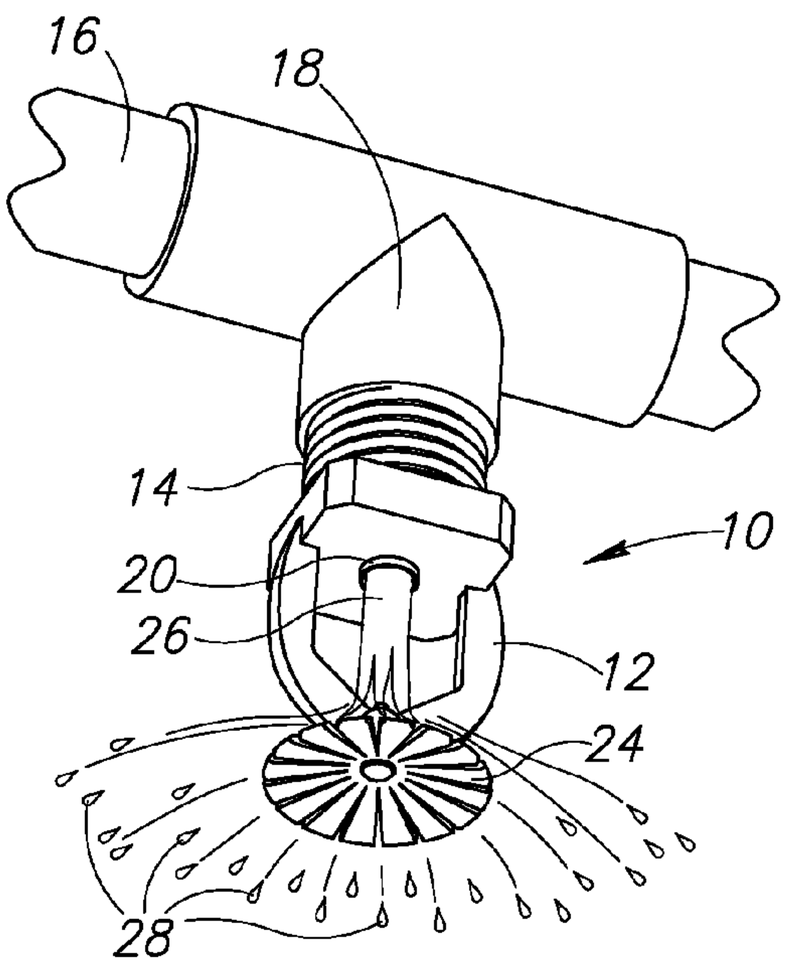


FIG.3
(PRIOR ART)

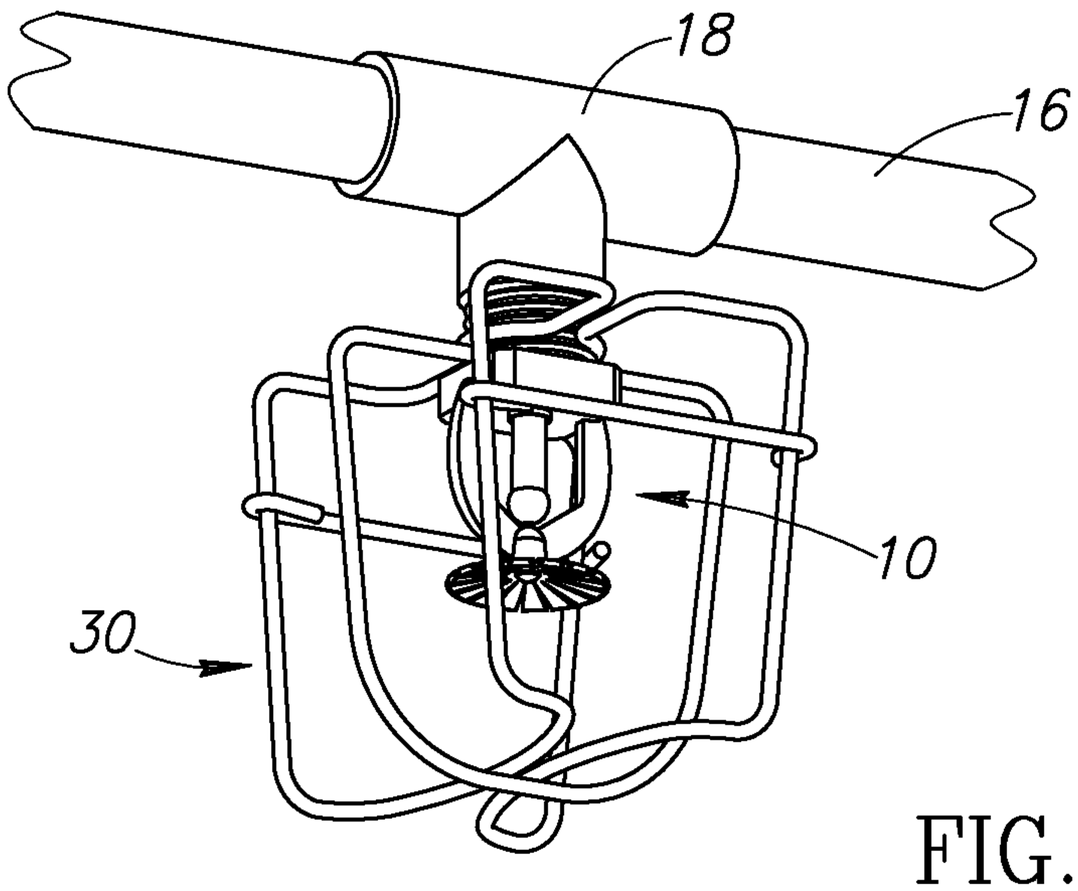


FIG.4
(PRIOR ART)

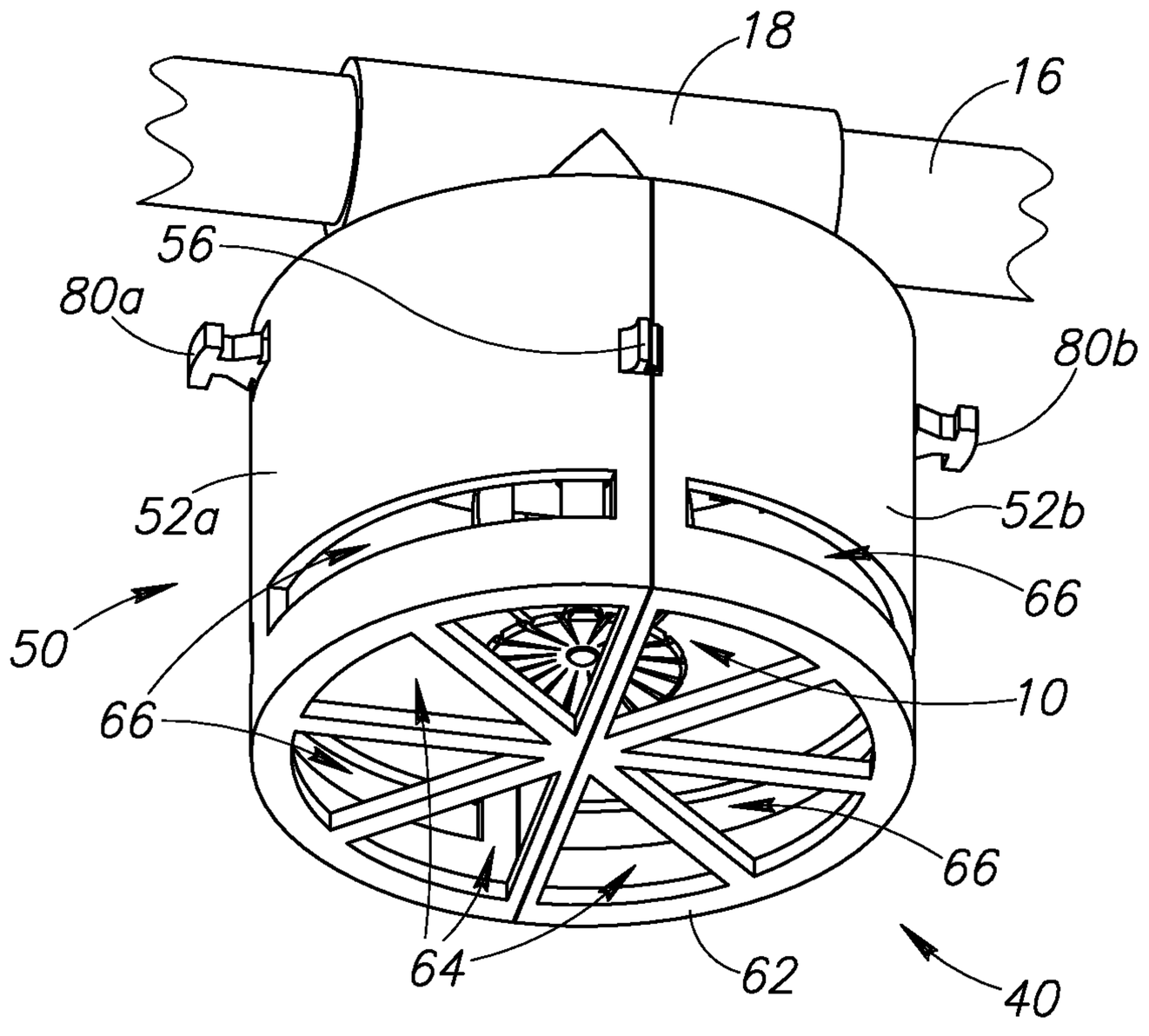
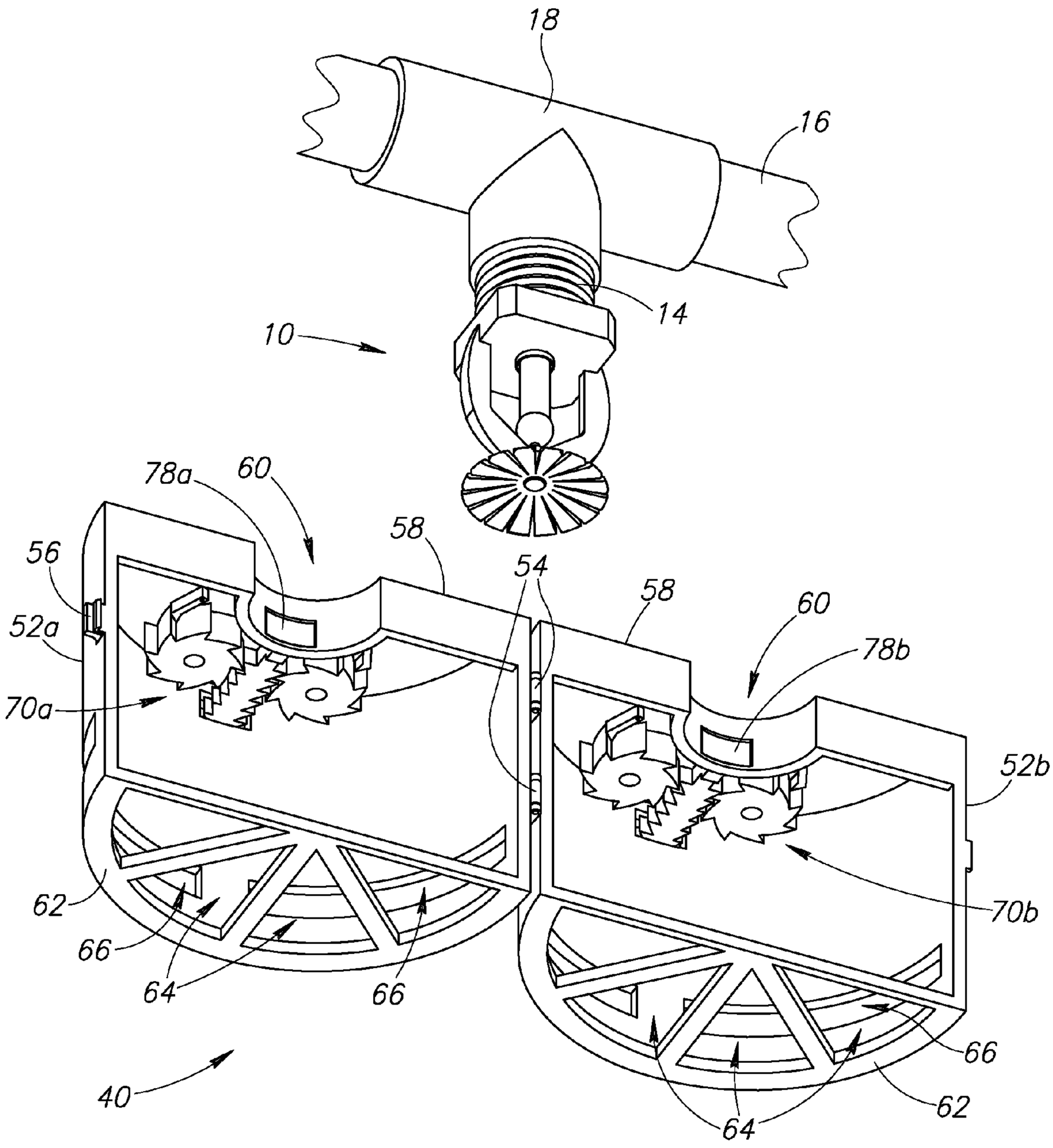


FIG.5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16
14
10
78a
60
58
56
54
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52a
78b
70a
52b
70b
62
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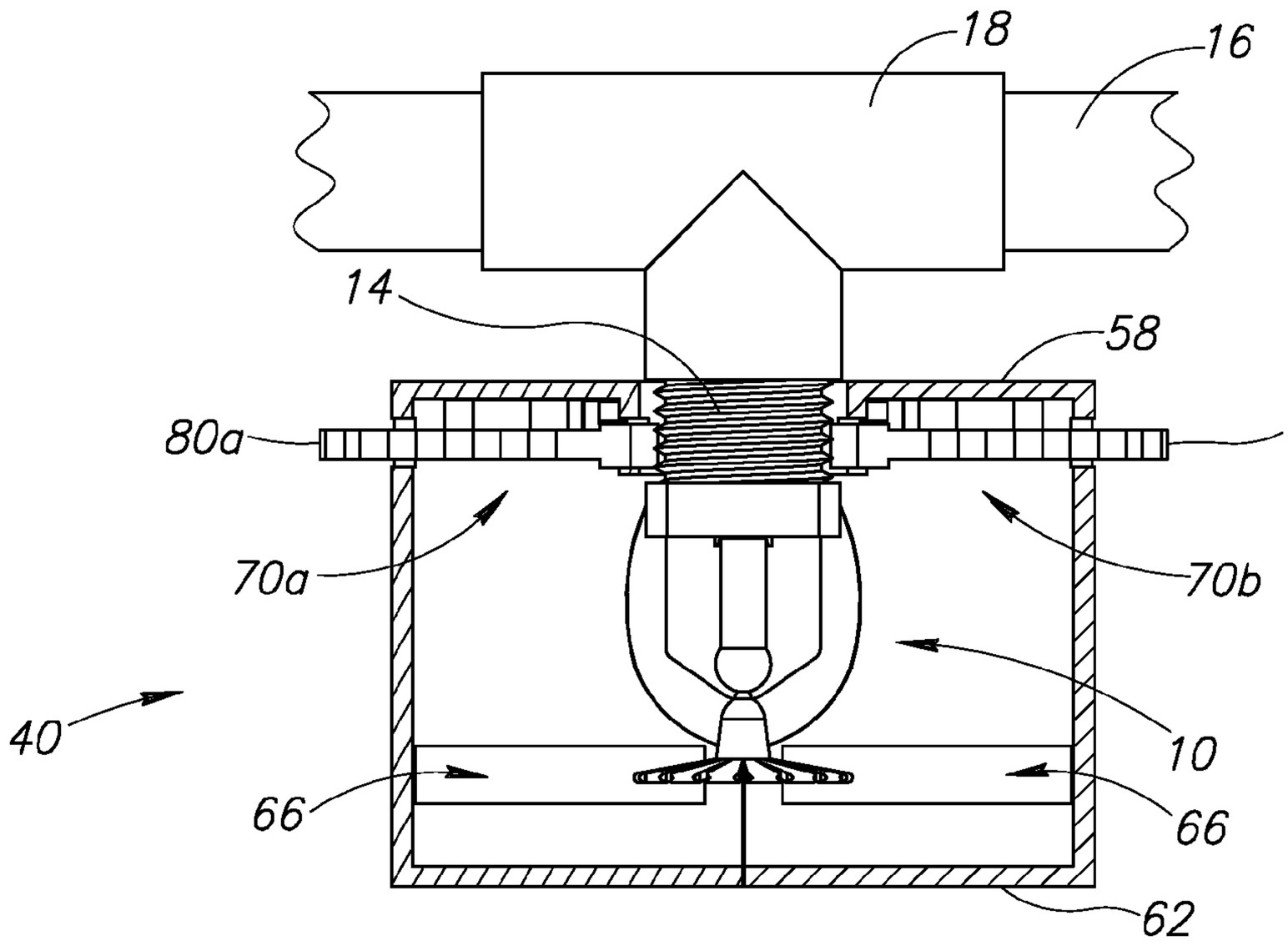
66
64
62
40

FIG.6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80b
70a
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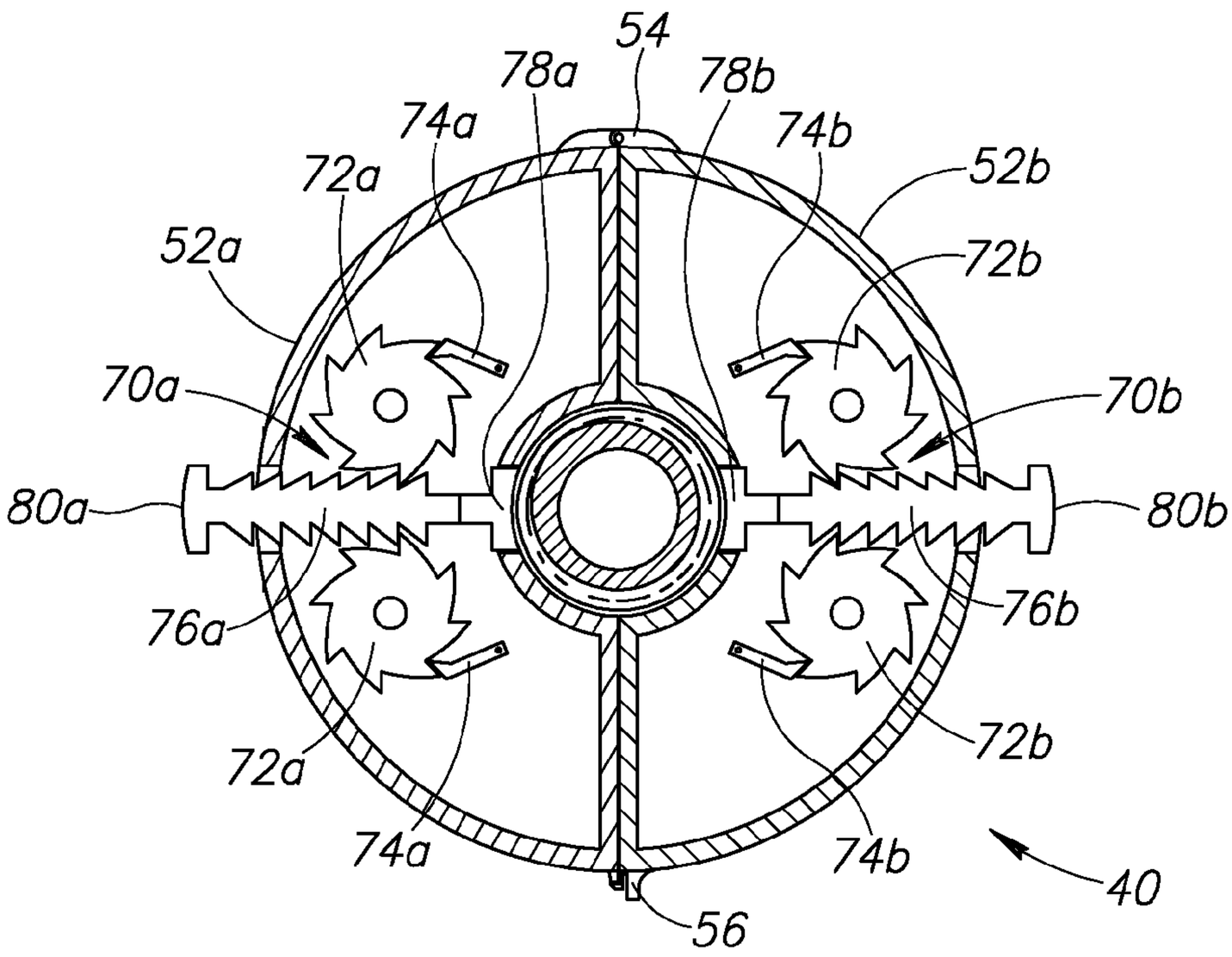
66
62

FIG.7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78a
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52b
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76b
72a
72b
74a
74b
56
40

FIG.8

SPRINKLER PROTECTION SYSTEM

PRIORITY CLAIM

This application claims the benefit of the filing date of U.S. Provisional Patent Application No. 61/470,306 filed on Mar. 31, 2011, which is herein incorporated by reference in its entirety.

FIELD OF THE INVENTION

This invention relates generally to sprinkler systems and, more specifically, to a sprinkler protection system.

BACKGROUND OF THE INVENTION

Currently there are over 6.8 billion square feet of commercial space in the United States. These spaces are comprised of businesses ranging from small retail stores to Fortune 500 companies. These spaces are protected by either a wet or dry fire suppression system that utilizes sprinkler heads for extraction of either chemical or pressurized water of the general nature show in prior art FIGS. **1-3**. The average mixed-use commercial space has a sprinkler head every 150 square feet; which means there are over 45 million active sprinkler heads protecting these spaces and several hundred million heads in non-commercial and commercial space combined.

With reference to FIGS. **1-3**, these sprinkler heads **10** are built with a frame **12** and a seat **14** connected to a supply **16**, such as a pipe, via an adaptor **18**. Each sprinkler head **10** typically includes a cap **20**, an operating mechanism **22** (such as a solder link or glass bulb), and a deflector **24**. The resulting automatic sprinkler together form a sealed unit that is expected to maintain its integrity, but also to operate efficiently if a fire ever threatens its protected area. The sprinkler parts are joined somewhat like a coiled spring, holding the energy needed to activate when released by heat from a fire. As shown with reference to FIG. **2**, when the sprinkler head is activated, for example by heat or other pressure exerted on the operating mechanism **22**, the operating mechanism breaks, releasing liquid **26** from the supply **16** via the adaptor **18**. As shown with reference to FIG. **3**, the released liquid is streamed towards the deflector **24** and thereafter disbursed in a predetermined but typically generally radial pattern **28**.

Mechanical impacts to sprinklers can result in damage and separation of parts, causing 100-300 gallons of liquid (typically water) to be spilled per minute. This causes substantial damage and costs incurred. The tangible costs are absorbed by insurance companies, contractors, tenants, and owners; but, the intangible costs are felt by the immediate parties involved such as tenants, neighboring tenants, clients, production and sales costs from the inability to provide the services or goods, maintenance, etc.

Building renovations can result in impacts of sprinklers, leading to an inadvertent discharge or leakage and malfunction at a later date. Although it is obvious that a large force can immediately open a sprinkler, it is less obvious that a smaller impact can do the same over time.

Currently the only physical protection for sprinkler heads are wire guards that remain in place at all times. As shown with reference to prior art FIG. **4**, these wire guards **30** are meant for protection of blunt force by large objects but allow for penetration of smaller objects and debris that are created when renovations are taking place. There are no current options to fully protect the head and its components from inadvertent damage that will still allow for water discharge in the event of an emergency.

SUMMARY OF THE INVENTION

This invention solves the problems associated with protecting the sprinkler heads from blunt force by large objects or the undesirable penetration of small objects and debris that are created when renovations are taking place. The invention is readily adapted to existing sprinkler heads and easily and efficiently installed, while providing dramatically improved protection of the sprinkler head and its components from inadvertent damage while allowing water discharge in the event of an emergency.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred and alternative examples of the present invention are described in detail below with reference to the following drawings:

FIG. **1** is an exemplary prior art sprinkler head as may be used as part of a fire protection system.

FIG. **2** is an exemplary prior art sprinkler head showing activation of an operating mechanism.

FIG. **3** is an exemplary prior art sprinkler head showing release and disbursement of fluid after activation of the operating mechanism.

FIG. **4** is an exemplary prior art sprinkler head and a prior art wire guard.

FIG. **5** is a perspective view of one embodiment of the present invention showing an installed protection system enclosing an exemplary prior art sprinkler head.

FIG. **6** is a perspective view of one embodiment of the present invention showing a protection system prior to installation on an exemplary prior art sprinkler head.

FIG. **7** is a cross-sectional side view of an installed protection system enclosing an exemplary prior art sprinkler head.

FIG. **8** is a cross-sectional top view of an installed protection system enclosing an exemplary prior art sprinkler head.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIGS. **5-8**, the preferred embodiment of the present invention is directed to a sprinkler protection system **40** having a housing **50** preferably consisting of two half sections **52***a*, **52***b* movably connected via hinges **54** and configured to close via a fastening clip **56** to form a substantially cylindrical enclosure. Each section **52***a*, **52***b* includes top surface **58** preferably having an opening **60** configured to fit around the seat **14** of the sprinkler head **10** or adaptor **18** of the supply **16** so as to secure the housing **50** above the sprinkler head with minimal or no contact with the sprinkler head components apart from the seat **14**. Each section **52***a*, **52***b* includes a bottom surface **62** preferably having a plurality of openings **64** configured to allow for the exit of released liquid **26** streamed towards the deflector **24** of the sprinkler head **10** after it is disbursed in the predetermined pattern **28** (see FIG. **3**).

The cylindrical half sections **52***a*, **52***b* are preferably substantially solid to provide maximum protection to the sprinkler head **10** from blunt force by large objects or the undesirable penetration of small objects and debris that are created when renovations are taking place. In one embodiment, a substantially rectangular aperture **66** is formed in the lower portion of each section **52***a*, **52***b* corresponding to the location of the deflector **24** of the sprinkler head **10** and configured to allow the disbursement of released liquid streamed towards the deflector **24** in a substantially radial direction after it is deflected according to the predetermined pattern **28**. In alter-

nate embodiment, the rectangular aperture **66** may be replaced with one or more apertures or perforations of various sizes and shapes (not shown), each of which, upon configuration to the sprinkler head distribution pattern **28**, would be substantially equivalent.

In the preferred embodiment, the housing **50** supports within each section **52***a*, **52***b* a plurality of one-way ratcheting clamps **70***a*, **70***b* that are preferably pressed from the outside inward with a rubber buffer to tightly secure to the pipe. This ratchet is designed to only push inward (one way ratchet) and secure around varying sizes of drop down sprinkler pipes and will not allow for release of the pipe until the shell clamp is released and the shell is removed from the pipe and head. Each of the clamps **70** include a plurality of ratchet wheels **72***a*, **72***b* locked in place with corresponding pawls **74***a*, **74***b* and rotatably operable by depression of a two-sided arm **76***a*, **76***b*. Each arm **76** supports on an interior end a grip **78***a*, **78***b* and on an opposite exterior end a head **80***a*, **80***b*.

In preferred operation, the housing **50** is installed around the sprinkler head **10** by closing the hinged sections **52** using the fastening clip **56**. Once the housing is closed, the rubber ended ratchet clamps **70** are located above the components of the sprinkler head **10** and upon operation of the clamps **70** using depression of the arms **76** to ratchet the ratchet wheels **72**, the grips **78** close securely onto the seat **14** or pipe via adaptor **18**. Upon installation, the apertures **66** preferably line up with the deflector **24** of the sprinkler head **10** to allow for any water that hits the deflector to exit the sprinkler protection system **40** with a minimal amount of impendence from the housing **50** as possible.

While the preferred embodiment of the invention has been illustrated and described, as noted above, many changes can be made without departing from the spirit and scope of the invention. Accordingly, the scope of the invention is not limited by the disclosure of the preferred embodiment. Instead, the invention should be determined entirely by reference to the claims that follow.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A housing for a sprinkler, comprising:

a first section having:

an upper wall;

a cylindrical half portion extending from the upper wall; and

a lower wall;

wherein the half portion has an aperture aligned with a deflector of the sprinkler to permit the deflector to direct water through the aperture and out of the housing;

a second section generally similar to the first section;

a hinge connecting the first and second sections at a first side of the housing;

a clip connecting the first and second sections at a second side of the housing opposite the first side, wherein the housing is configured to be opened at the hinge and placed over the sprinkler and closed upon the sprinkler;

an arm having an end grip at a proximal end of the arm configured to engage with the seat of the sprinkler, and a head at a distal end of the arm; and

a latch configured to maintain the end grip of the arm against the seat of the sprinkler and to resist movement of the arm away from the seat, the latch comprising a ratchet having a wheel with teeth and a pawl configured to prevent the arm from retreating away from the seat.

2. The housing of claim **1** wherein the arm comprises a first arm and the latch comprises a first latch, the housing further comprising a second arm generally similar to the first arm and a second latch generally similar to the first latch, wherein the first and second arms are opposite one another and configured to press the seat between them.

3. The housing of claim **1** wherein the end grip is resilient.

4. The housing of claim **1** wherein the arm extends through the cylindrical half portion and out of the housing.

5. The housing of claim **1** wherein the lower wall has an aperture to permit water to pass through the aperture and out of a lower end of the housing.

6. The housing of claim **1** wherein the apertures in the first section and the second section comprise two rectangular apertures.

7. The housing of claim **1** wherein the aperture has a vertical dimension that is slightly larger than a vertical dimension of the deflector.

8. The housing of claim **1** wherein the aperture has a vertical dimension that is approximately twice as large as a vertical dimension of the deflector.

9. The housing of claim **1** wherein the aperture is sized and positioned relative to the deflector to permit water to exit the housing with minimal impedance from the housing.

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